

**THE GENUS *LIOMETOPUM* MAYR
(HYMENOPTERA: FORMICIDAE)
IN CALIFORNIA, WITH NOTES ON NEST
ARCHITECTURE AND STRUCTURAL IMPORTANCE***

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Abstract.—The genus *Liometopum* Mayr has two species that occur in California. Both species are structural pests that can build elaborate nesting structures in human habitation. The nest trabecula of *Liometopum occidentale* Emery is described and presented here. Two nesting incidences within homes are reported.

Key Words.—Insecta, Hymenoptera, Formicidae. *Liometopum occidentale*, *Liometopum luctuosum*, nest structure, structural importance

The genus *Liometopum* Mayr is comprised of four extinct and five living species. Two of the living species are from the Old World and three are from western North America (Cook 1953; Eckert & Mallis 1937; Gregg 1963a; Wheeler & Wheeler 1973, 1986). *Liometopum apiculatum* Mayr ranges from Colorado through Arizona, New Mexico and Texas into Mexico. It is reported from foothill areas at elevations of 1.2 to 2.1 kilometers (Gregg 1963a, Smith 1979). *Liometopum occidentale* Emery, commonly referred to as the velvety tree ant, ranges from northern Oregon through California into Mexico. In California, this species is most abundant at lower elevations from sea level to 1.2 kilometers (Cook 1953). However, Mallis (1941) took this species at 1.8 kilometers elevation on Mt. Baldy, Los Angeles County, California. I have also seen this species on several occasions associated with human habitation on wooded lots at Mt. Baldy, California. On 17 Jul 1993, I observed it in association with oak and sycamore trees at Pilgrim Pines campground, Yucaipa, California. This campground is at an elevation of approximately 1.5 kilometers.

Liometopum luctuosum W. M. Wheeler was previously considered a subspecies of *L. occidentale*. It was elevated to species level by Wheeler & Wheeler (1986). This species ranges from Wyoming to western Texas thence to Nevada and California and into Mexico. It was reported as a montane species occurring at elevations of from 1.2 to 2.4 kilometers (Gregg 1963a; Wheeler & Wheeler 1973, 1986). However, in Tuolumne and Calaveras Counties in California, *L. luctuosum* can be found at 0.3 kilometer elevation and higher. It is common at 0.8 kilometer level in Tuolumne county (J. Tassano, personal communication). I collected this species once on the north shore of Big Bear Lake, Big Bear, San Bernardino County, California. I observed this species on 17 Jul 1993 trailing along the base of a low concrete wall at Pilgrim Pines campground in Yucaipa, California.

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ECONOMIC IMPORTANCE

Liometopum occidentale is associated with structures (Bennett et al. 1988, Ebeling 1975, Hedges 1992, Mallis 1990). It is an aggressive and pugnacious species which feeds on insects and honeydew produced by homopterans. The workers possess repugnatorial glands from which odoriferous volatile secretions are produced. The odor resembles that of butyric acid, which most people find disagreeable. *Liometopum occidentale* is commonly found in pronounced columns going up and down trees such as oak, alder, elm, cottonwood, pine, and sycamore, where they tend honeydew secreting insects. These ants occasionally invade homes creating nuisance problems. Homes on properties with trees are more prone to invasion than those without trees especially when limbs from nearby trees are touching and/or resting on the structure. On two occasions, I observed these ants walking on power lines to gain access to homes. Eckert & Mallis (1937) reported that their trails may extend 60 meters or more from the nest.

Although these ants cannot sting, they are very aggressive and readily swarm onto any individual that disturbs them. They bite and then spray an irritating fluid into the wound. *Liometopum occidentale* is a bane of picnickers in campgrounds, parks, and other outdoor recreational areas in southern California (Ebeling 1975).

Pest control operators in California are not familiar with this ant. Because of its size, its single node, and the concave dorsum of its thorax in profile, it is commonly mistaken for carpenter ants, especially *Camponotus clarithorax* Emery which is about the same size and exhibits similar coloration. *Camponotus clarithorax* is the most common carpenter ant species in the lower elevations of urban southern California.

I have found infestations of *L. occidentale* in structures in the cities of Claremont, Glendora, Montclair, Ontario, Pomona, Mt. Baldy, Redlands, and Riverside, in southern California. Most of these infestations were associated with oak trees, one with pine, and two with sycamores.

LIOMETOPUM LUCTUOSUM

Wheeler (1905) found this species to be closely associated with pine trees. Gregg (1963a) found that it is not limited to *Pinus* spp. This is probably valid as ants of this type are opportunistic species which exploit whatever resources are readily available to them at a given time. However, observations over many years indicate that *L. luctuosum* exhibits a strong preference for pine trees (J. Tassano, personal communication). It has excavated nests in styrofoam insulation and caused damage to sheetrock in structures (Tassano 1987). In structures, it throws out chewed up insulation or wood which form piles below the infested area (Tassano 1987). Wheeler & Wheeler (1986) listed five records of this species in houses in Nevada. In two of these they were producing piles of fine sawdust; in the third they were catching insects attracted to lights; and in the fourth they were damaging plasterboard.

Liometopum luctuosum is eaten in Mexico. Immature stages of the reproductives are locally known as "escamoles". They are regarded as a delicacy and are widely utilized as food. This ant has been raised and cultured by peasants in Mexico for many years (Elorduy de Conconi et al. 1986).



Figure 1. Carton nest structure of *Liometopum occidentale* Emery taken from a nest in a wall void of a house in Redlands, California.

LIOMETOPUM OCCIDENTALE

Figure 1 shows a portion of the architectural work of *L. occidentale* taken from an interstud wall void of an interior partition wall abutting a stall shower of a home in Redlands, California. The subfloor beneath this stall shower was damaged by moisture and fungus. Upon examination, it became evident that the fungus damage extended into the wall abutting the shower. While gaining access to this wall, a large colony of *L. occidentale* was found in the lower portions of two interstud voids. Large numbers of worker ants came out from this area. A repugnant, disagreeable odor immediately became evident. After the ants were killed with a pyrethrin aerosol, the wall was opened revealing a mass of loose, leaflike, papery material that is apparently masticated cellulose. This material covered a spongiform mass of chambers and galleries composed of a carton type material made by the workers (Fig. 1). Two buckets of nesting materials were removed from the interstud voids of this house. The interior sides of the drywall were scarified. No holes going completely through either side of the drywall were evident. The owner claimed that he was never bothered by these ants indoors.

Around the house were several large oak trees with branches resting on the tile roof of the house. The property is a typical wooded lot of this area of Redlands, California and it presented an ideal habitat for *L. occidentale*.

A similar carton trabecula is presented in Gregg (1963a: 792, plate XXIV) taken from a nest of *L. apiculatum* in Colorado Springs, Colorado. Gregg (1963b) described another nest of *L. apiculatum* which was taken from the ponderosa pine-covered foothills near Boulder, Colorado. The trabeculae of this nest were

composed of particles of sand and clay cemented together and incorporating fragments of what appeared to be mica crystals. This nest structure was brittle and crumbled upon handling. Elorduy de Conconi et al. (1986) described a cartonlike interlacing and anastomosing nest structure for *L. luctuosum* in Mexico except that the nests of this species do not always have trabeculae. From these reports it would appear that all of the New World species of the genus *Liometopum* construct elaborate nests. The materials used in constructing a nest depend on what is available and whether or not the nest is located in the soil or above ground.

Another incident of *L. occidentale* nesting in a structure occurred at a single family residential property in Riverside, California. The residents of this property were experiencing a persistent ant problem. These ants were initially thought to be carpenter ants and they were treated as such but the problem persisted. On the second visit, the attic above the bathroom was inspected as the ants were previously seen there. Upon lifting up the rolled insulation, large numbers of *L. occidentale* were found inside and below the insulation. Subsequent remodeling work in the bathroom entailed removing a large wall mirror which revealed several holes about 2.5 mm in the drywall. These holes were made by workers which were found behind the mirror and in the wall void behind the drywall. This wall was an exterior insulated wall. Upon opening this wall, large numbers of *L. occidentale* workers came out. Their typical dolichoderine odor was evident. Hollow cavities were found in the insulation for about 1.8 meters of wall void. Large amounts of pine needles were present in the wall. No particular nest structure was found in this wall and no trabeculae were evident.

The exterior area adjacent to the infested wall had three pine trees whose branches were touching the structure thus providing access for the ants to invade the house. Inspection of the outside areas revealed long trails of *L. occidentale* on the wooden fencing bordering the horse trails. I have also seen *L. occidentale* on many occasions trailing on wooden fences.

Wheeler (1905) stated that all American species of *Liometopum* nest in the soil. Other nesting areas reported and/or suggested in the literature are: in or under decaying logs, the interior of hollow trees, under rocks, under boulders, in duff, under wood, under bark, in crevices in trees, under stones, in hollow places in trees, beneath fallen timbers, etc. (Cook 1953, Gregg 1963a, b, Eckert & Mallis 1937, Mallis 1941, Wheeler & Wheeler 1973, 1986). Many of these nesting areas are not available to these ants in urban situations. The nesting of these ants in human habitation is an example of an opportunistic species exploiting a resource provided by man.

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